AERIAL MOOSE SURVEY
FUNDY NATIONAL PARK
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To Arnold Boar, Professor at University of New Brunswick, for providing navigation on the Aerial Survey and ensuring the Loran C equipment was working properly and for providing the recorded data obtained during the flight.This was the first year that the survey has been conducted using Loran C equipment and your expertice in use of this equipment was greatly appreciated.

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1.0 INTRODUCTION

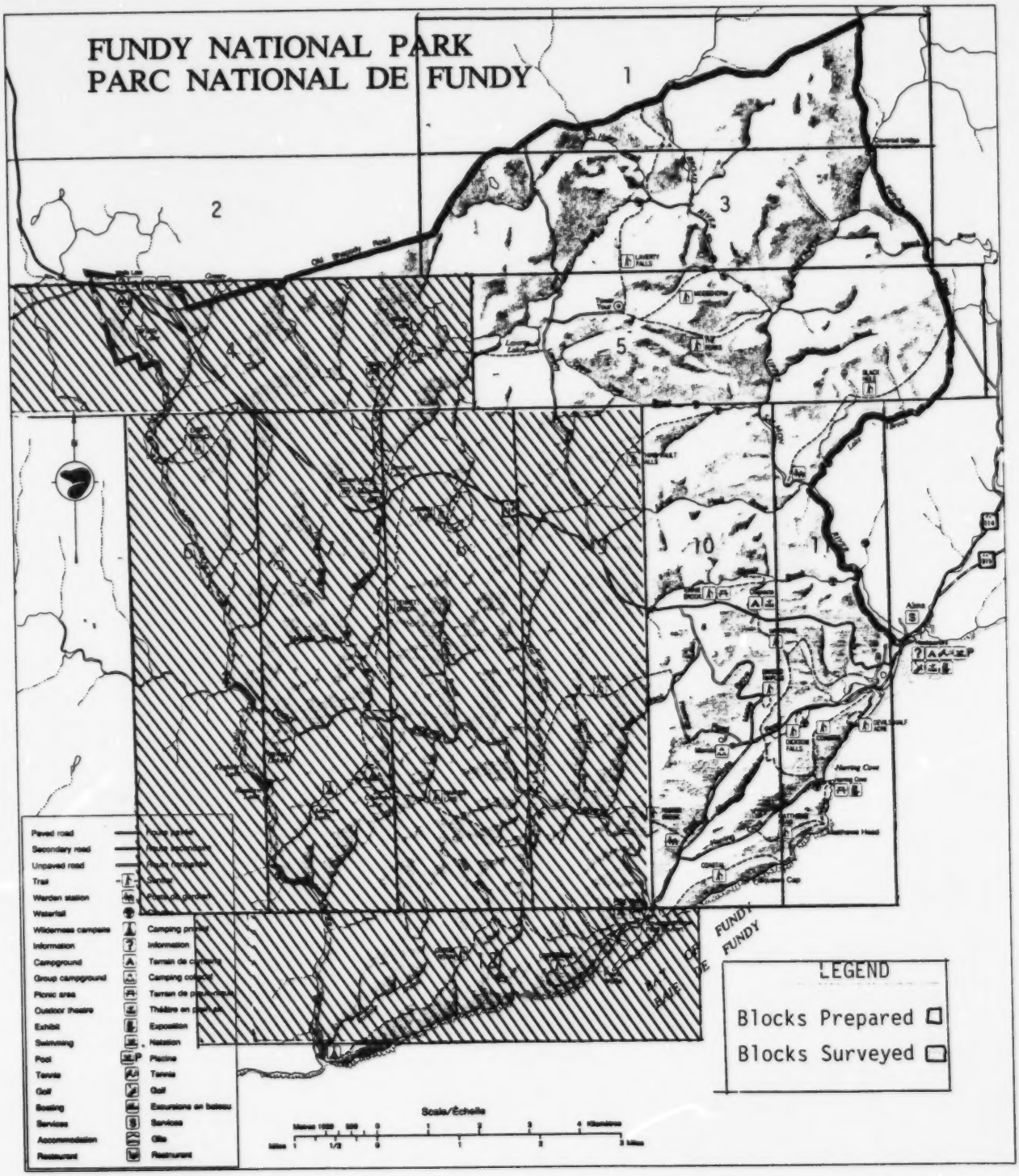
The moose population of the park is currently low. These low numbers are partly caused by their common sharing of habitat with deer who are hosts to a tick (p. tenuis) which causes mortality in moose. Also, a severe spruce budworm infestation effected large areas of forest since the last survey and has resulted in changes to moose habitat areas. The last aerial moose survey was conducted in 1981 leaving a nine-year lapse in surveys. Data is required to update the population status and to identify and protect critical areas such as wintering areas. To fulfill this requirement, the park was divided into twelve blocks. Six blocks were randomly drawn(figure 1). Four of the blocks were successfully surveyed (figure 3).

2.0 METHODOLOGY

The survey was flown about 24 hours after a fresh snowfall of 16 cm. The wind was calm and skies were clear. A revised block system of sampling was set up with the assistance of the provincial wildlife biologist according to their techniques, and implemented. The block systems covered a 2.5 x 10 km. area with six flight lines drawn 0.50 km. apart within the block. The park was divided into 12 blocks and drawn onto a 1:50,000 scale topographical map. The random blocks were chosen placing twelve numbers into a hat and drawn. Each number was recorded as it was drawn.

UTM coordinates were taken from the beginning and end of each transect line within each block and imported into a computer program that provided the corresponding degrees. This data was then forwarded to the pilot to put onto the Loran C. The first six randum blocks were imput into Loran C. The Loran C is navigational equipment used to pinpoint transect line start and

FIGURE 1: Aerial Moose Survey Blocks, Fundy National Park. Feb. 1990.



finish points, keeps the pilot on the transect line and to allow easy repositioning onto the transect line after diverting to follow moose tracks. This technique has been successful in increasing the accurracy of moose population estimates in surveys

There were three observers, two in the rear and the navigator in the front. The pilot also spent time observing. The altitude was maintained near 150 metres (500 feet) above ground level and the air speed was maintained at 80 km/hr, except when following tracks or passing over open areas, when the altitude and speed fluctuated.

Wolfe Lake Warden Station was used as the fill-up point. Fuel was picked up at Fredericton and stored prior to the survey. It was then hauled to Wolfe Lake the morning of the survey.

Each observer had radio communications with the navigator, who recorded all data on a 1:50,000 topographical map. The start and finish times for each transect within each block was recorded on the map to obtain the length of time required to fly each block. The weather condition recommended before initiating the survey was used as a guide in choosing the survey data (Table 1). When a moose was spotted, it was circled until a positive sex identification was made. If the animal was in heavy timber and the sex could not be determined after five minutes, the moose location was recorded as unknown sex. When moose tracks were observed, they were followed and the area circled for a maximum of five minutes trying to locate the animal. If it could not be located in that time period, the data was recorded as tracks, unknown.

Table 1: Weather Conditions Required Before Initiating the Aerial Survey

WEATHER	CONDITIONS REQUIRED
1. Sky	Clear/high overcast
2. Fresh Snowfall	Minimal 5-10 cm.
3. Wind speed	<25 km/hr.
4. Flight time	9:00 a.m. - 3:00 p.m.
5. Flight after snowfall	1-4 days
6. Dates	December - March-01

3.0 RESULTS

The aerial moose (Alces alces) survey was conducted on February 27, 1990 between the hours of 9:00 a.m. and 12:00 noon. Supplementary data on the survey including weather conditions indicated good conditions for conducting the survey (Table 2). Four of the expected six to eight blocks were successfully surveyed. The four blocks covered approximately 78 km^2 of park land resulting in about 32% coverage within the park including waterbodies.Provincial land surveyed within the block system accounted for about 23 km^2 of area. A total of 4.6 hours out of the allotted 7.4 hours were flown. Survey block numbers 4, 6, 7 and 8 were surveyed. Moose were spotted and tracking undertaken resulting in the sighting of 7 moose in block number 6 and 1 moose in block number 8 (Figure 2). The sightings in block 6 included: 3 cows, 1 bull, 2 unknown adults, and 1 unknown young from last year.Sightings recorded in block 8 included 1 adult bull(table 3). All moose track locations were recorded on the map when the animal could not be located. The one moose sighting recorded within the boundaries of the park, was located in a bog habitat. The remainder of the moose recorded in the province were in and adjacent logged, cutover and mixed forests. All moose seen were on flat areas. Block number 9 was not started due to snowflurries that had quickly moved inland off the bay. In an attempt to continue the survey, a block in the northern area of the park was attempted, however shortly after commencing the first transect, the snow moved in, resulting in postponing the survey for the day. Weather conditions required to complete the survey were not obtained and the survey was cancelled in March.

Table 2: Supplementary Data Recorded - Aerial Moose Survey - 1990

Pilot	Ken Etchanson
Helicopter	Bell 206
Navigator	Dr. Arnold Boer
Observers	Left rear - Lorie Collingwood
	Right rear - Francois Granger
Survey blocks	4, 6, 7 & 8
Moose observed	8
Hours flown	4.6
Cost	$2,967. (including fuel)

FIGURE 2: Location of Moose Sightings on the Aerial Survey Conducted in Fundy Nat'l Park in February, 1990.

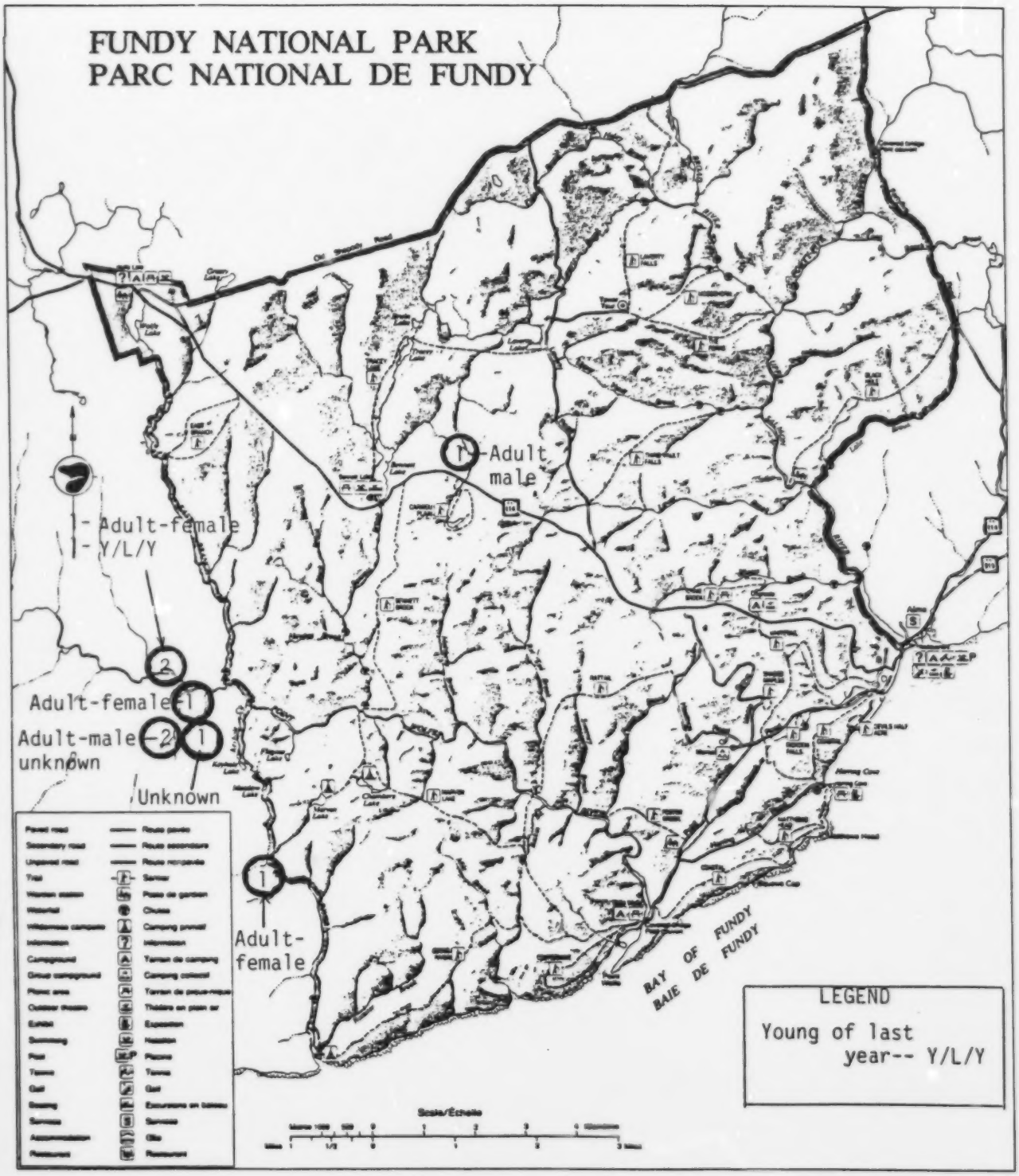


Table 3: Aerial Moose Observation Structure

Block #	Flight Line		Moose Observations				
	Start	Finish	Cow	Bull	Unk.	Total	Groups
4	09:30	10:02	0	0	0	0	0
6	10:05	10:50	3	1	3	7	5
7	11:00	11:20	0	0	0	0	0
8	11:27	12:03	0	1	0	1	1
TOTAL :	Province		3	1	3	7	5
	Fundy National Park		0	1	0	1	1
GRAND TOTAL:			3	2	3	8	6

4.0 DISCUSSION & CONCLUSION

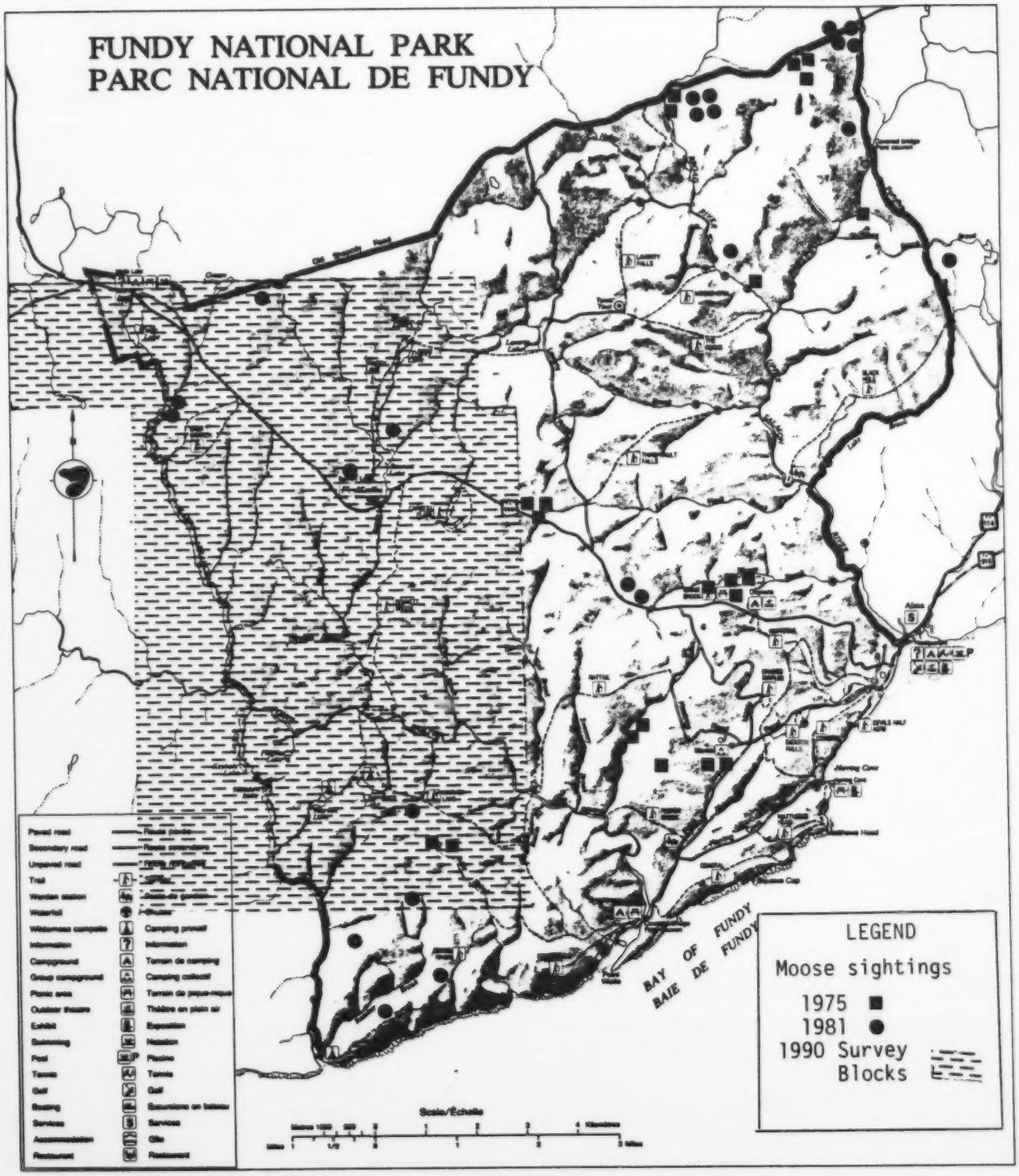
The method of using 2.5 x 10 km block size resulted in the blocks expanding a considerable distance outside the park boundaries. The block system was chosen to match that of the provincial blocks. The flight lines were drawn 0.50km apart within each block, resulting in missing a strip of 0.25km at the beginning and end of each block.

The survey was conducted in February, while the ideal time was indicated to be January.(Deichman,H. 1987.). The helicopter was not available when conditions were good to survey, resulting in finally conducting the survey in February. Due to a service contract, another helicopter company which was available could not be used.

One moose was sighted within the park in a bog association. The park biophysical is in the process of being updated. Delineating moose habitat areas was not feasible due to the change in the forest canopy since the last moose survey in 1981. There was a wildlife track transect survey conducted prior to the February aerial moose survey. Three moose tracks were observed and recorded, each in different areas. Two of the tracks recorded were located outside the survey blocks.

It appears from reviewing the results from the 1975 and 1981 surveys (figure 3),that the moose population has decreased.There is a need to conduct another survey within three years to clarify movements and determine population changes.

FIGURE 3: Location of Moose Sightings During the Aerial Surveys in Fundy National Park in 1975 and 1981.



5.0 RECOMMENDATIONS

1. Conduct an aerial moose survey every three years

2. Conduct the survey between the period from mid November to mid January.

3. Change the survey lines within the survey blocks to include coverage of the 0.25km area missed at the beginning and end of each block.This will result in one addition flight line within each block.

4. Review the service contract specifications and add a clause that will allow us use of another company helicopter if the contract helicopter is not available when requested.

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